

Figure 1. A HPLC-ESI-MS system

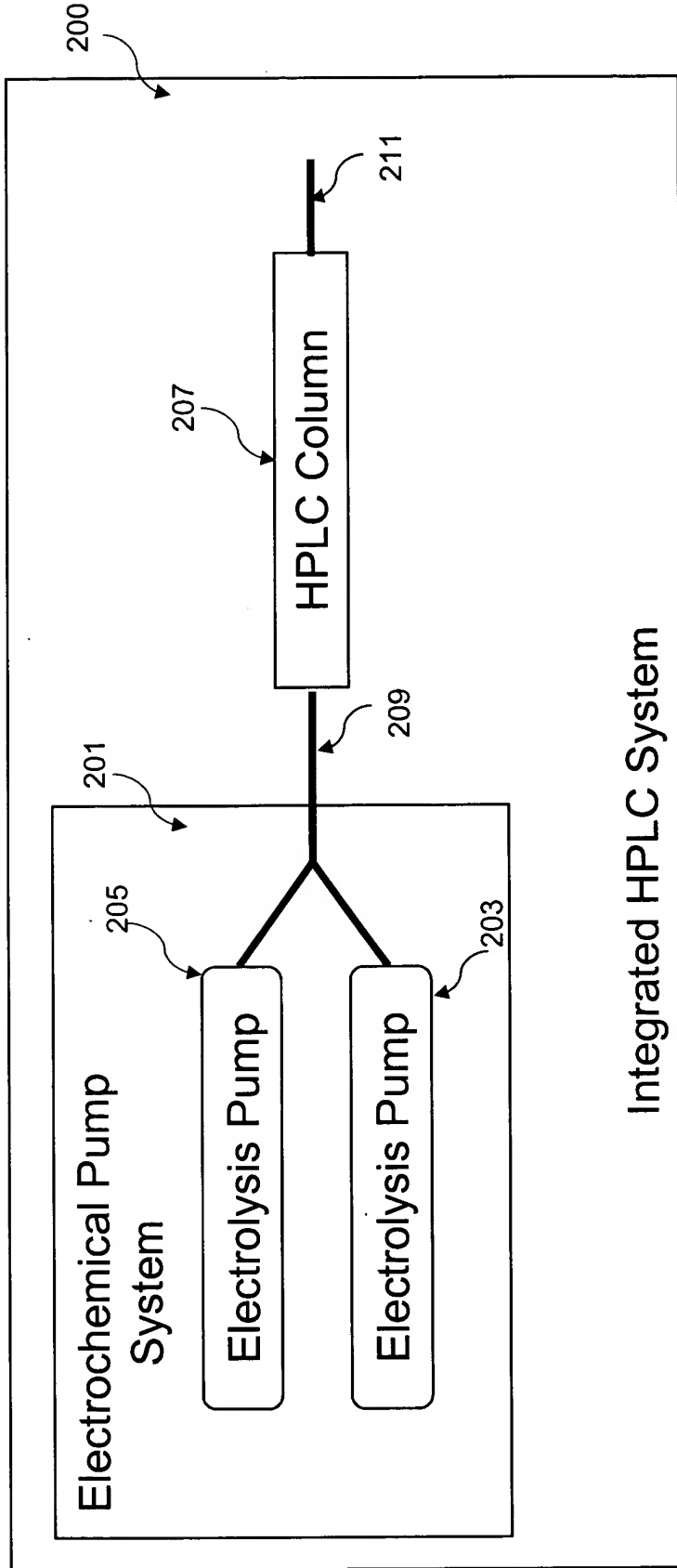
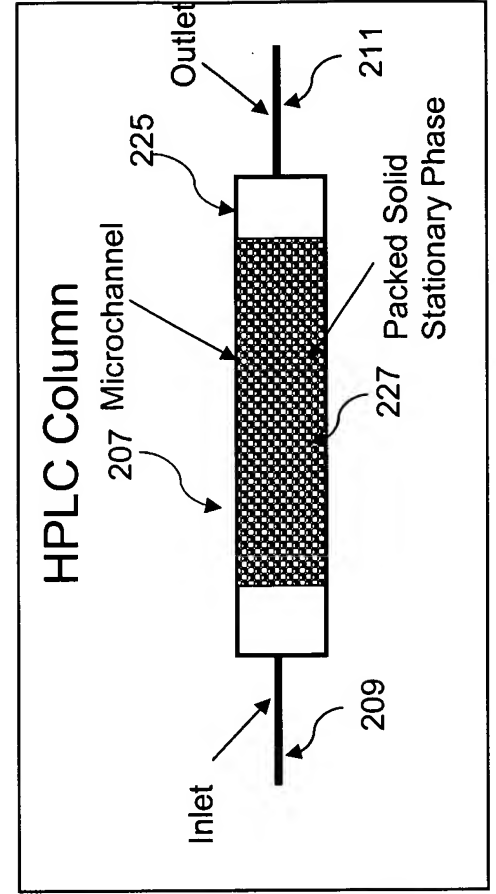
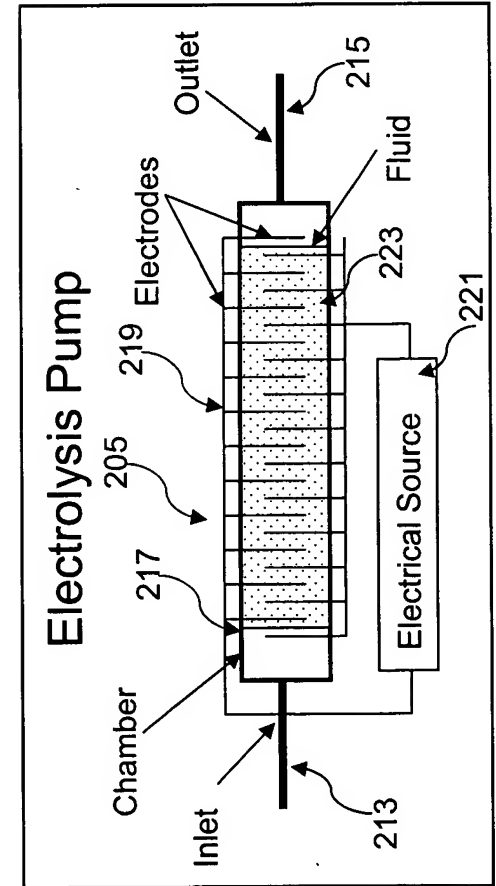


Figure 2. Integrated Microfluidic HPLC System



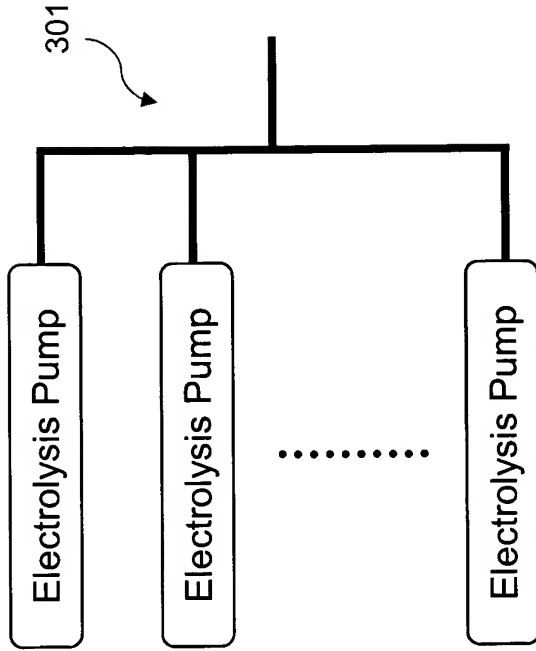


Figure 3a. Electrolysis Pumps
Configured in Parallel

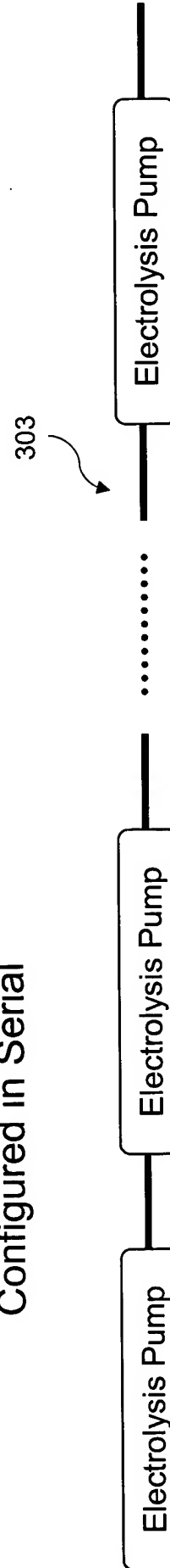
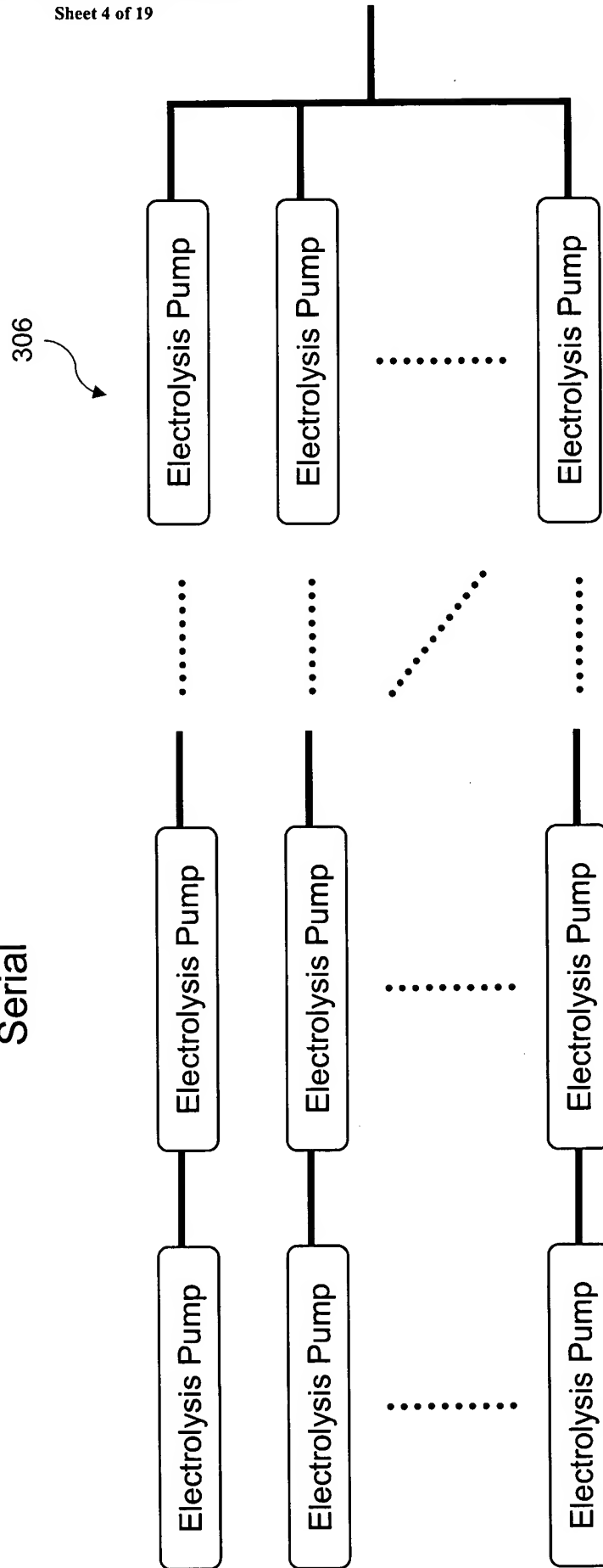


Figure 3b. Electrolysis Pumps
Configured in Serial

Figure 3c. Electrolysis Pumps Configured in Parallel and
Serial



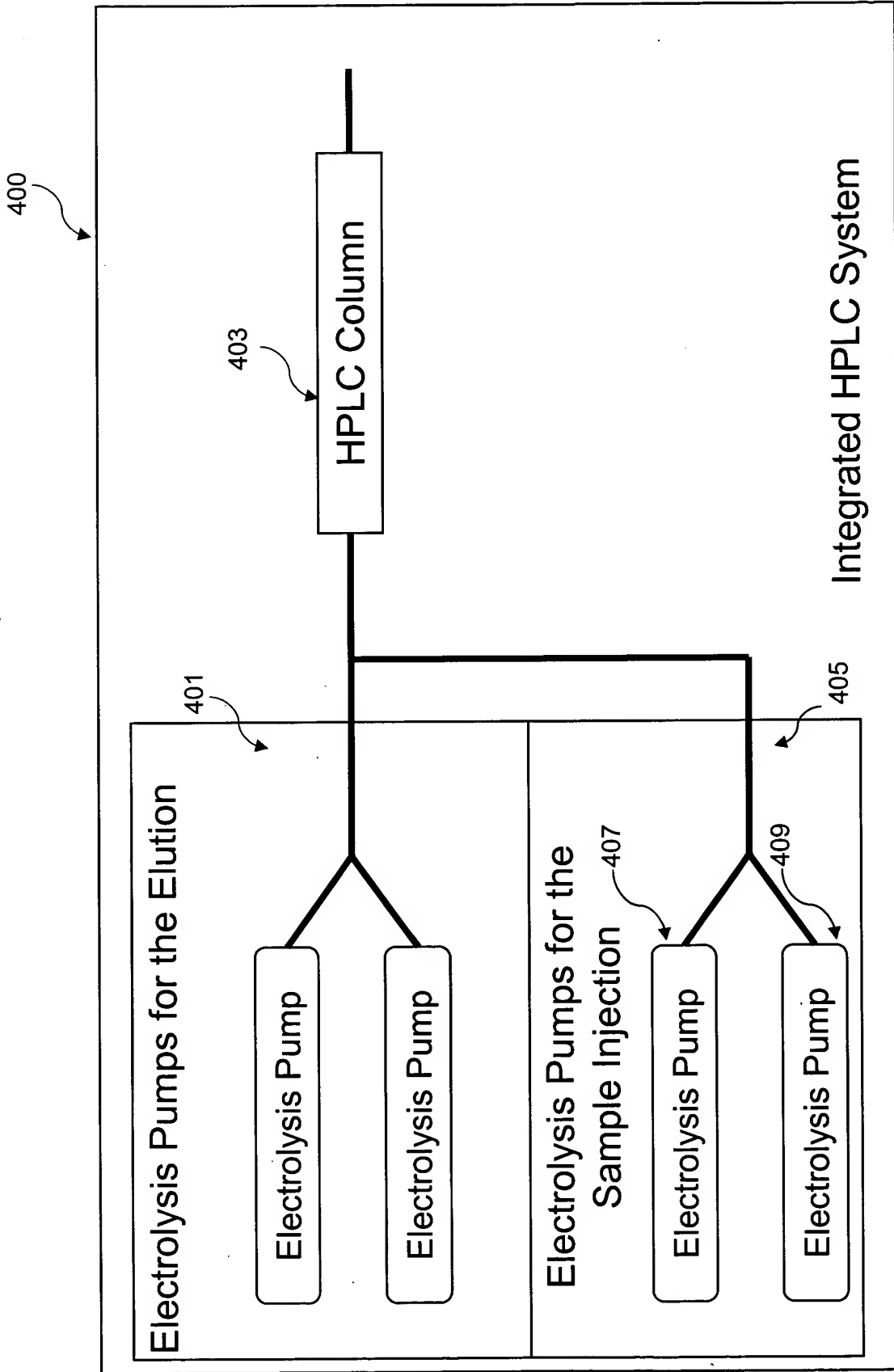


Figure 4. Integrated Microfluidic HPLC System With Sample Injection

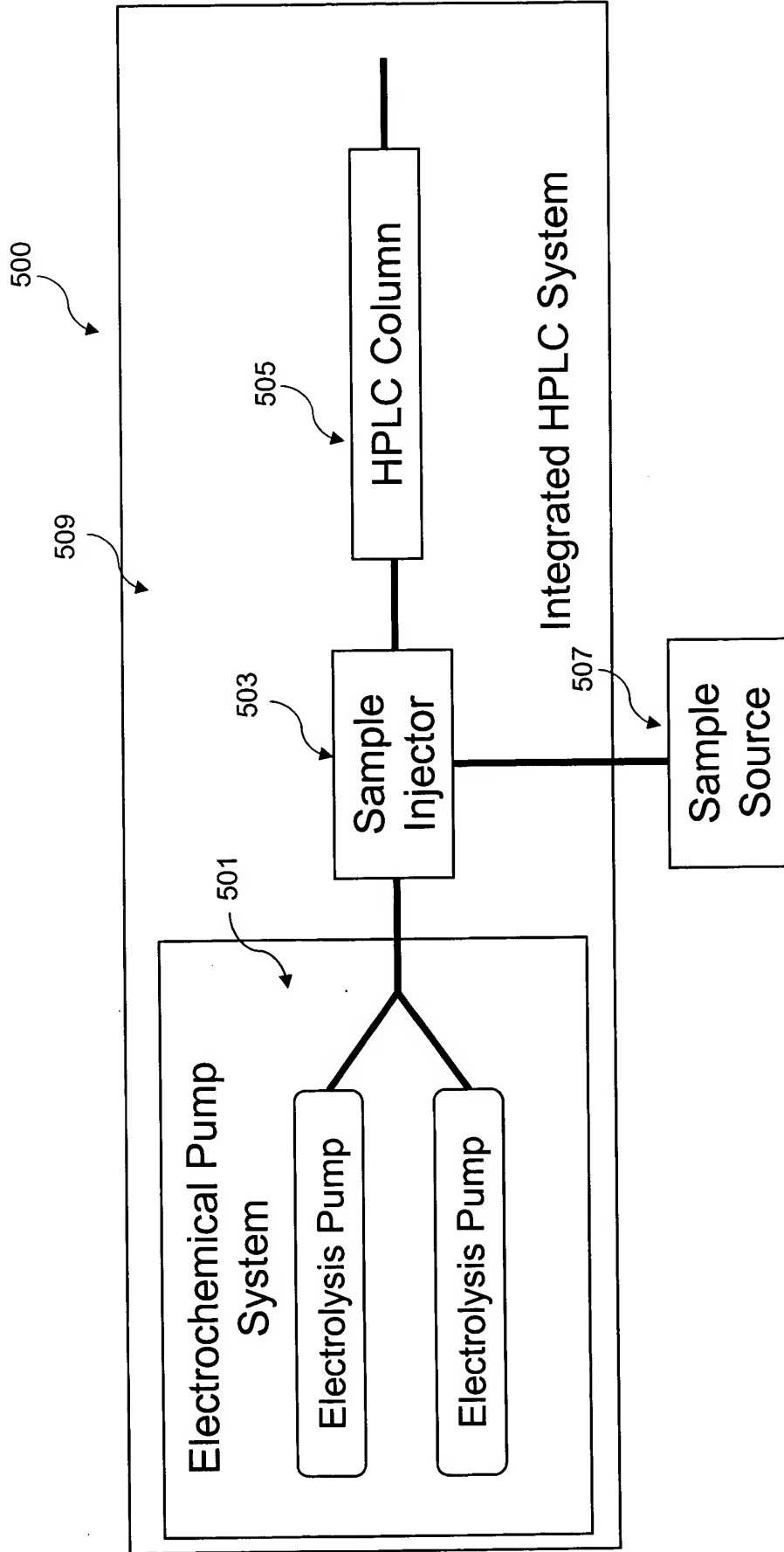


Figure 5. Integrated Microfluidic HPLC System With Sample Injection

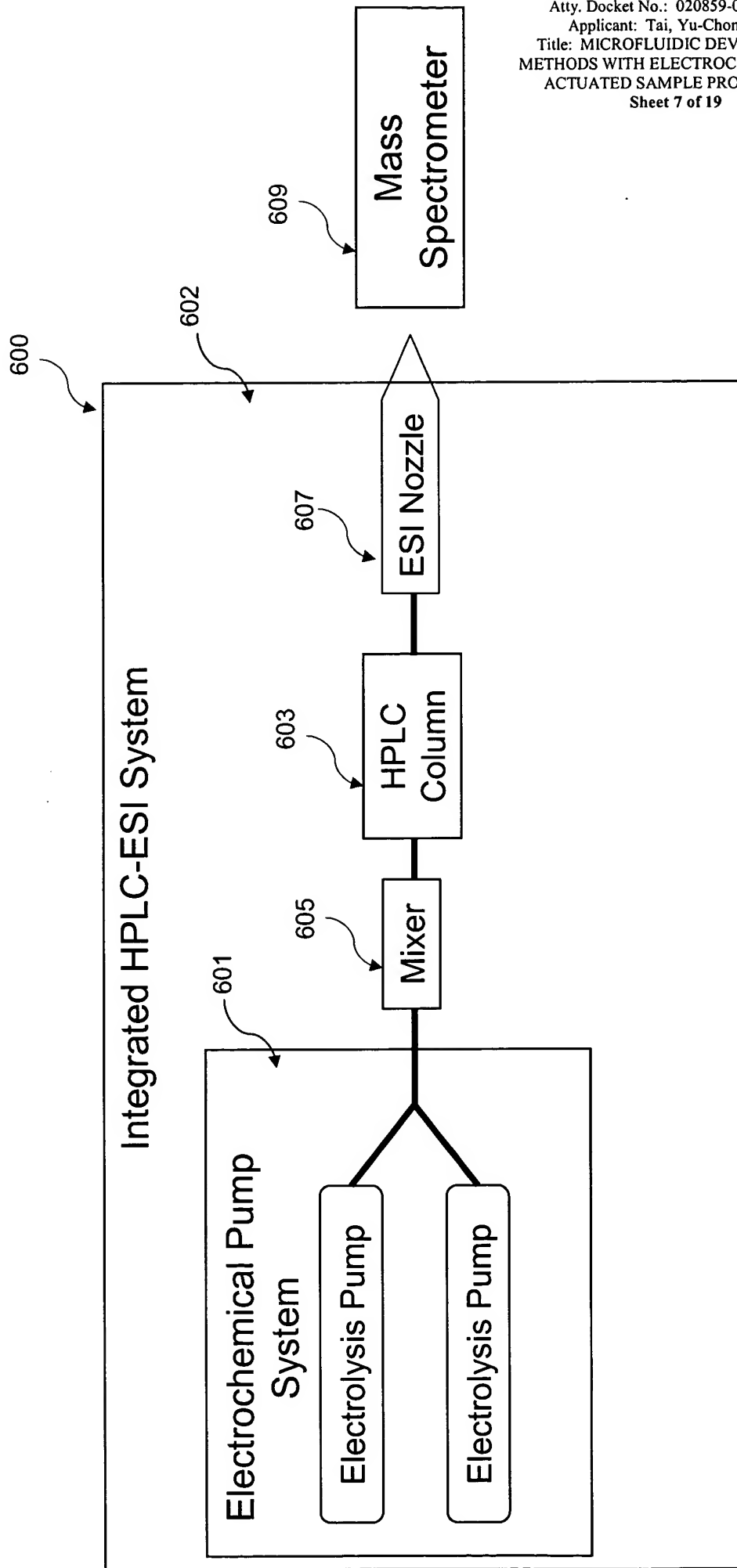


Figure 6. Integrated HPLC-ESI-MS System

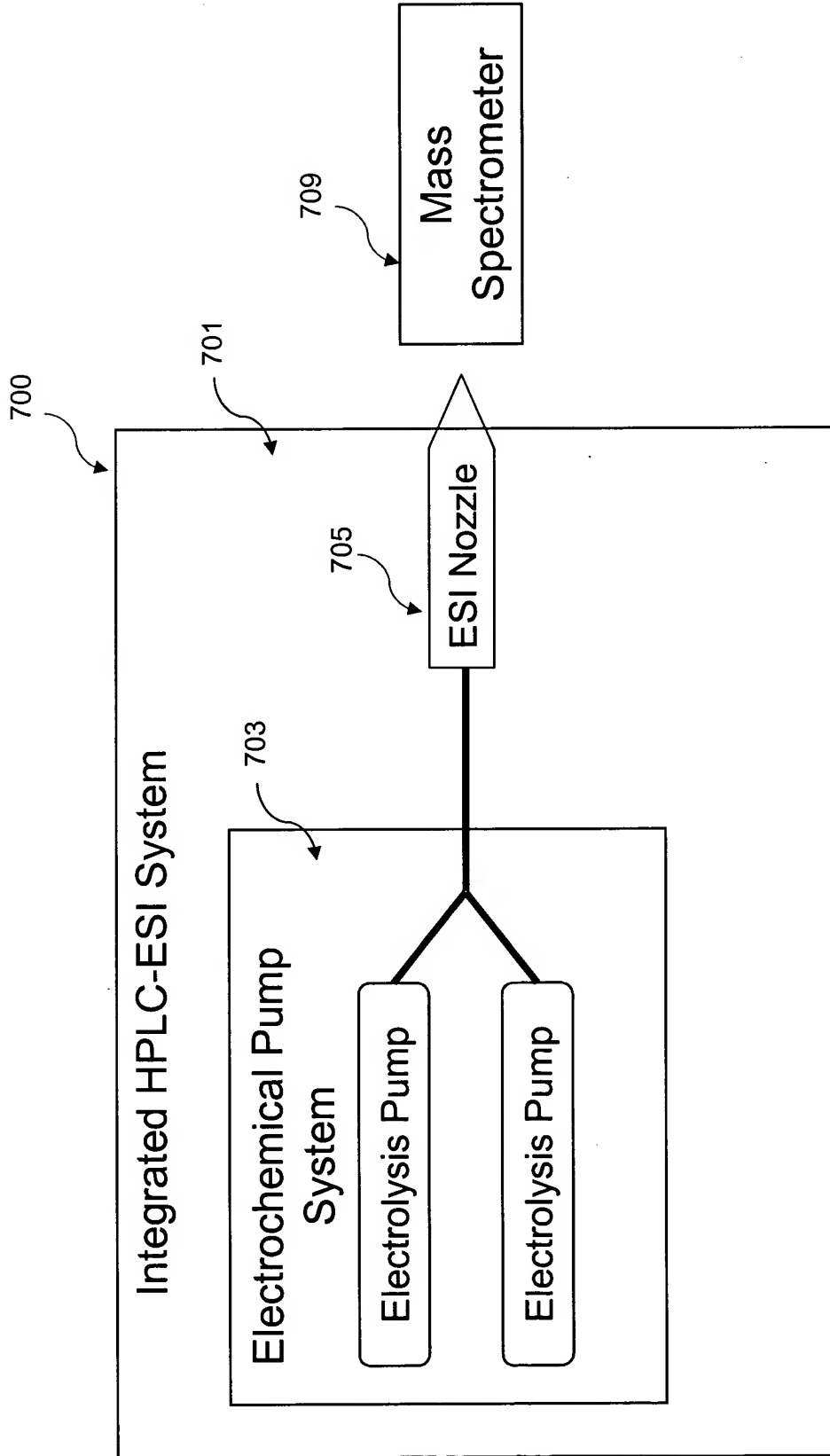


Figure 7. Integrated ESI-MS System

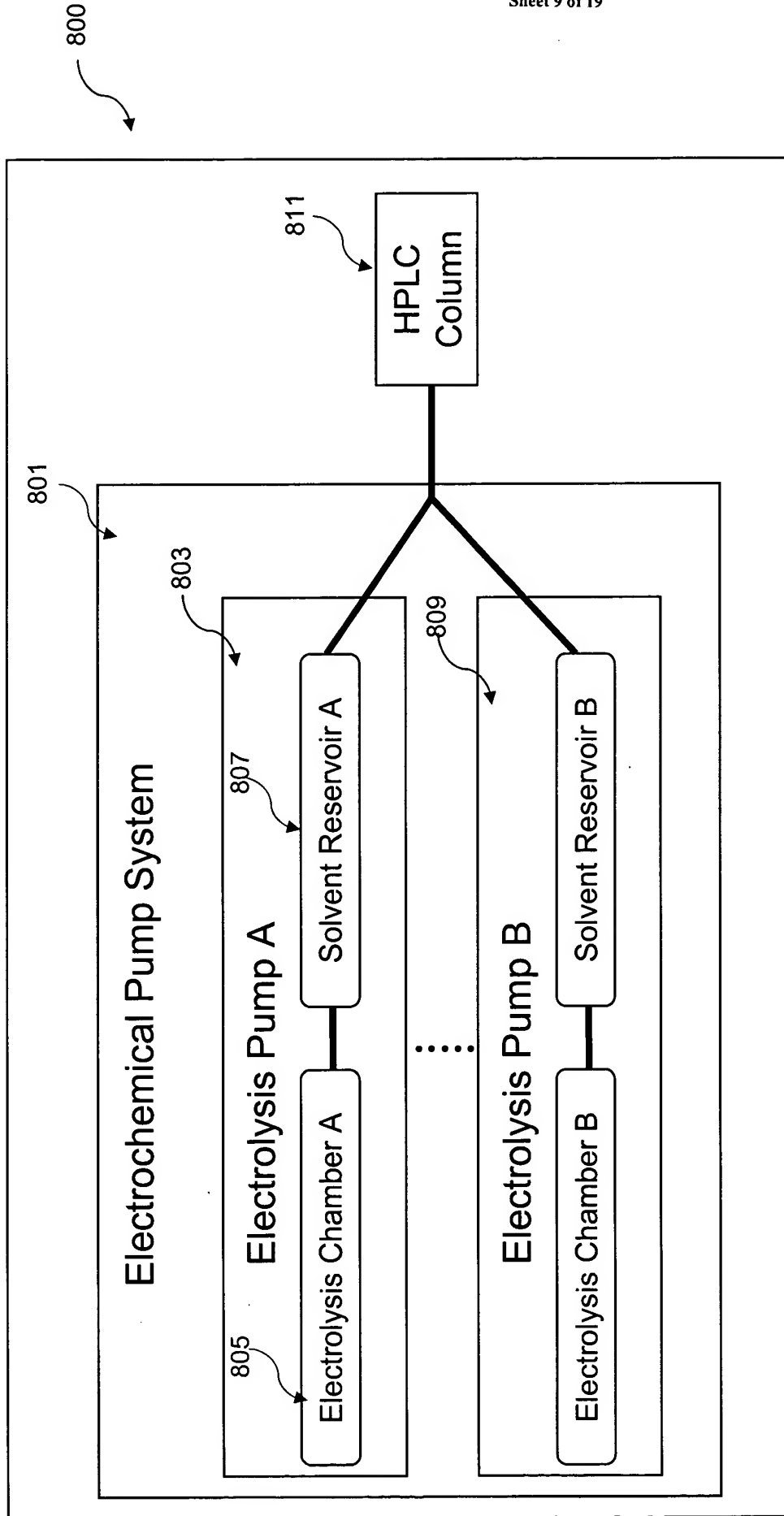


Figure 8. A HPLC system with a multi-chamber arrangement for electrolysis pump.

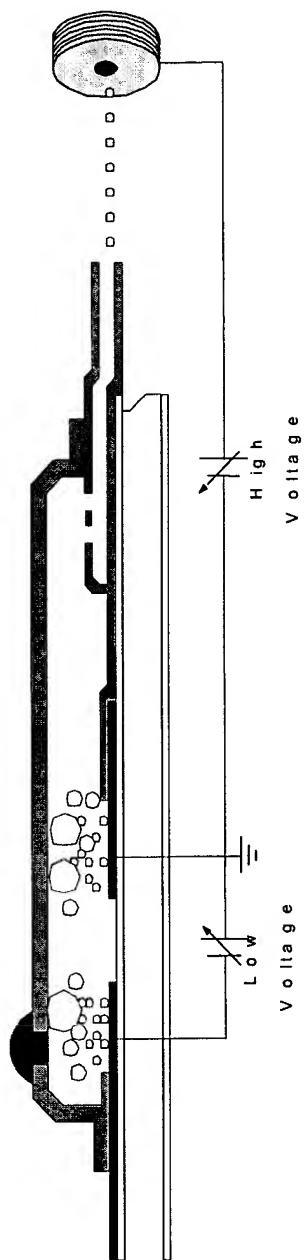
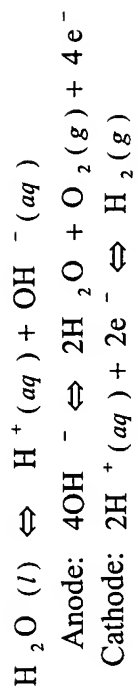


Figure 9.

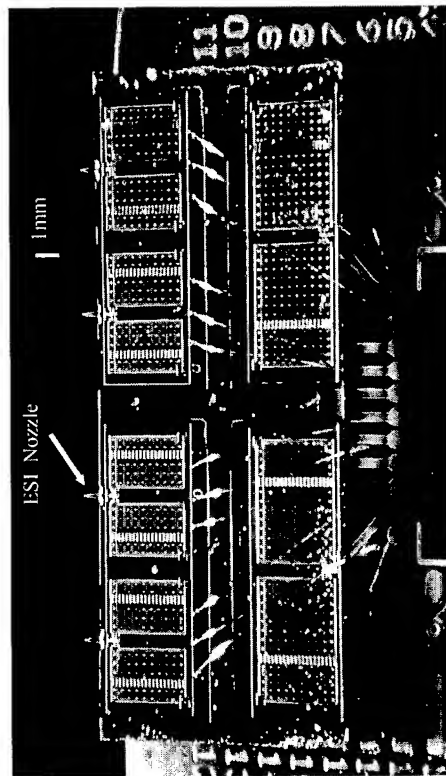


Figure 10.

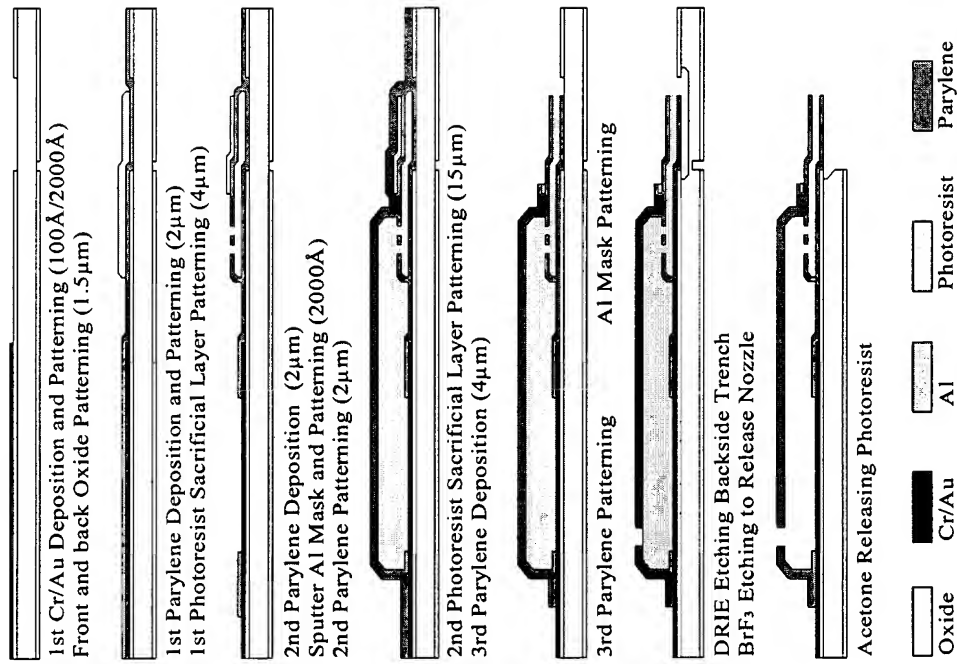


Figure 11.

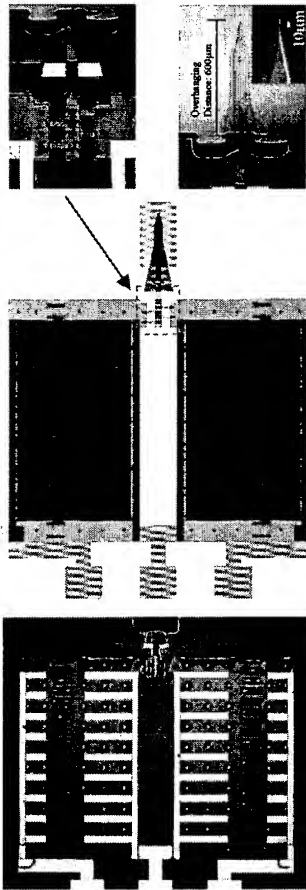


Figure 12.

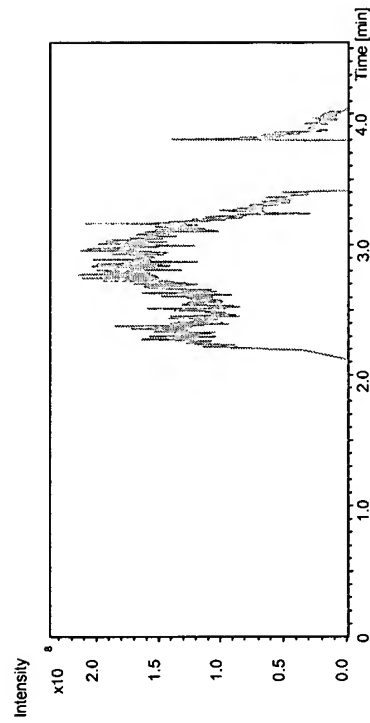


Figure 13.

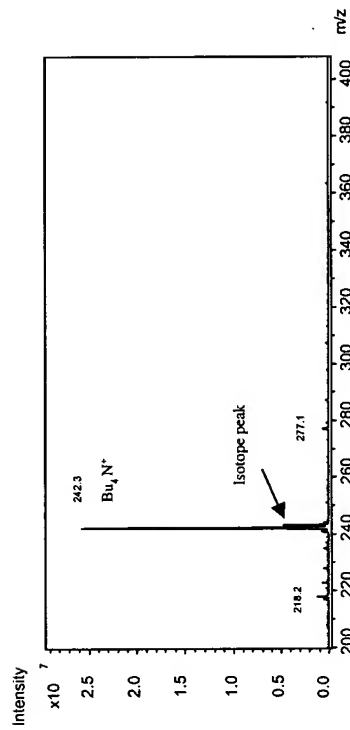


Figure 14.

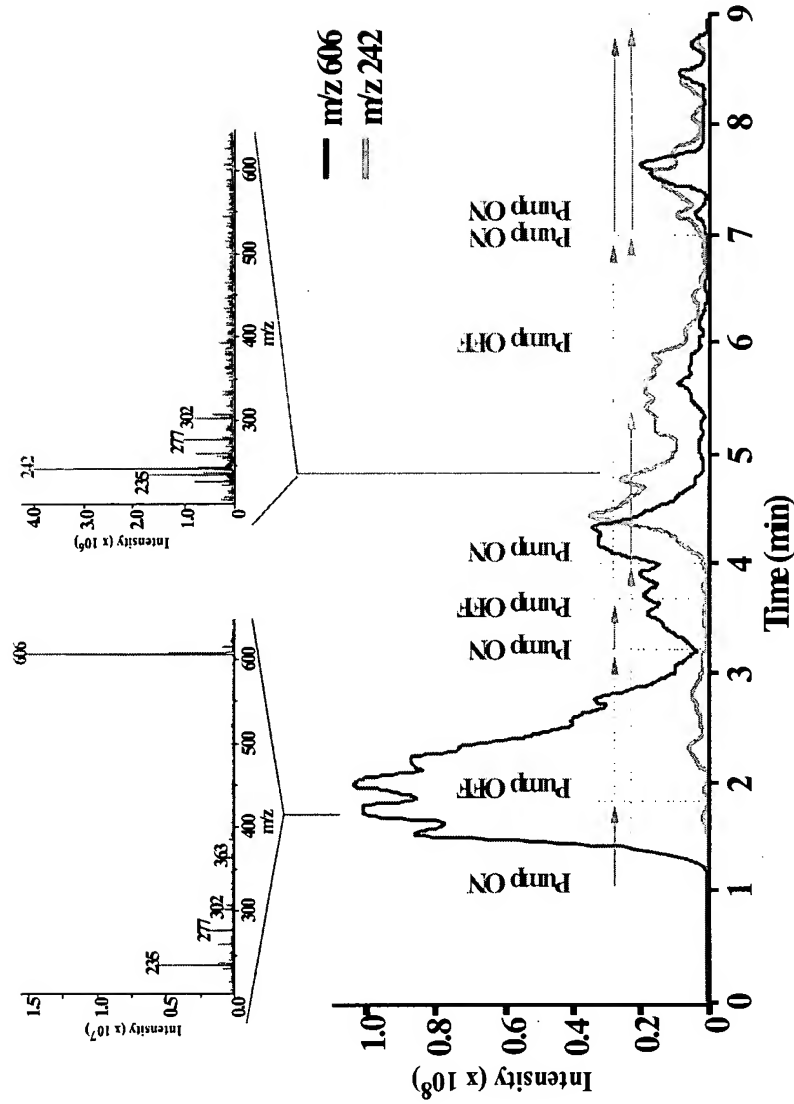
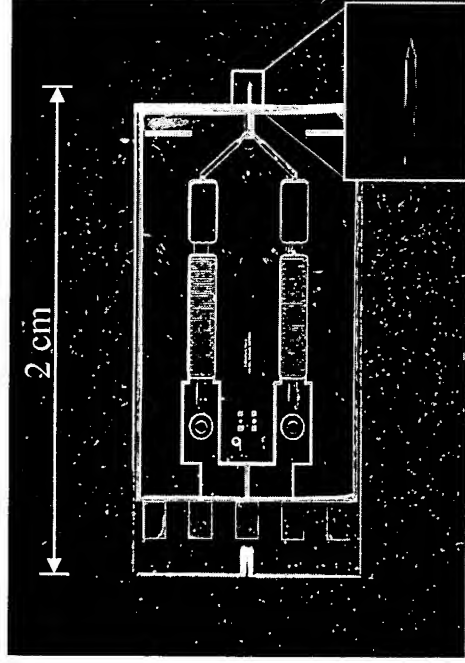


Figure 15.

Figure 16



Fabricated Device Picture

Specifications:

Volume: $2+1=3 \mu\text{L}$

Flow Rate: 100 nL/min

Pressure: 100 psi

Time: 20 min

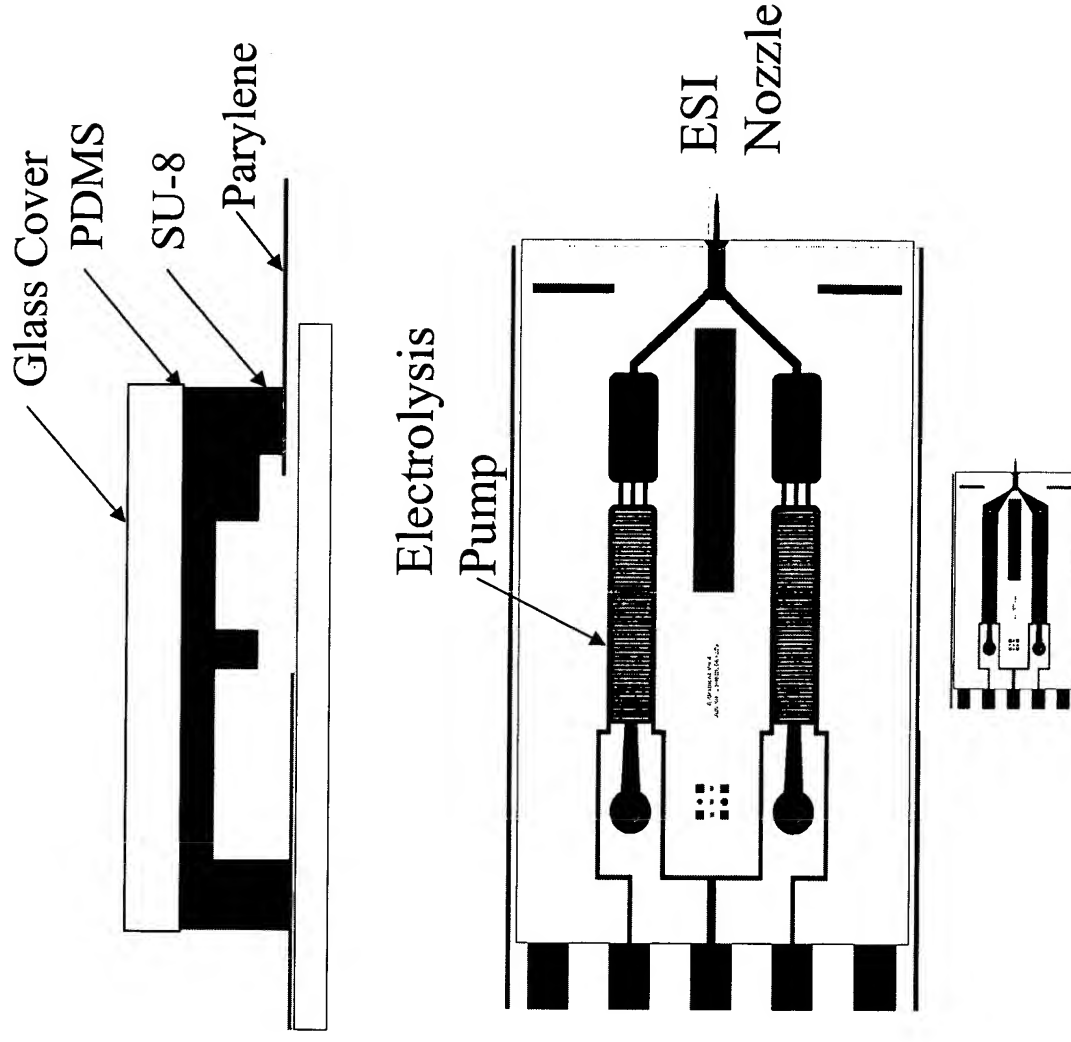


Figure 17
chip#4 Electrolysis chip test (chip#2 reused)
sample A: 10 pmol/ μ L TBAI in 90/10/0.1 water/acetonitrile/formic acid
sample B: 25 pmol/ μ L Angiotensin in 95/5/0.2 water/methanol/formic acid

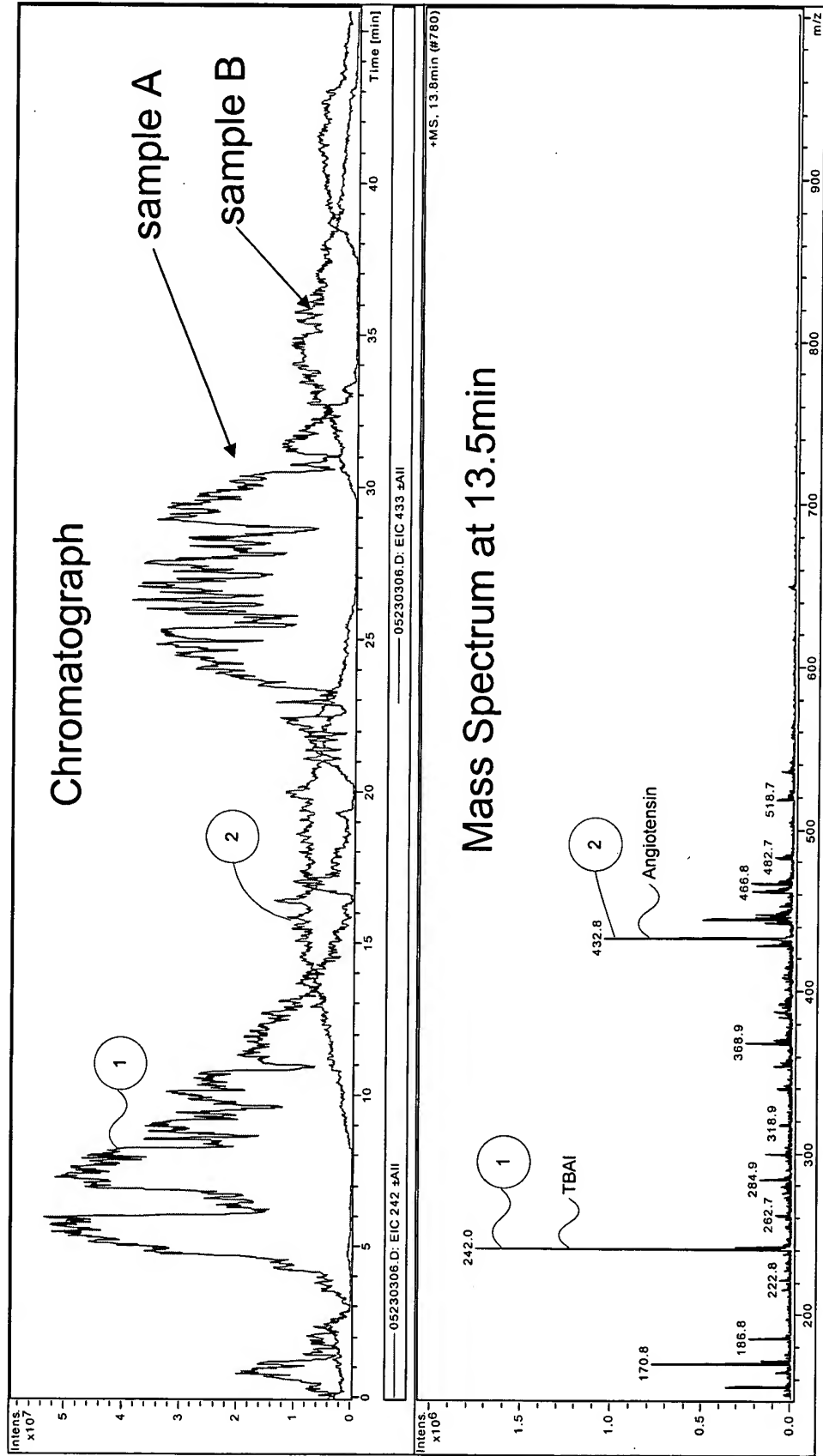


Figure 18

